

REMARKS

This application has been reviewed in light of the Office Action dated February 13, 2008. Claims 1-4, 8-12, 17-20, 24-25, 30-43 are pending in the application. By the present amendment, claims 1, 18 and 31 have been amended. No new matter has been added. Claims 5-7, 13-16, 21-23 and 26-29 have been cancelled without prejudice. No issues requiring further search have been raised by the amendments. The Examiner's reconsideration of the rejection in view of the amendment and the following remarks is respectfully requested.

By the Office Action, claims 31-33, 35, 38 and 41-43 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Publication No. 2003/0216905 to Chelba et al. (hereinafter Chelba).

Chelba is directed to a speech system that employs a conventional syntactic parse tree structure and inputs semantic information into the parse tree to provide a two-level approach in training the system. The two level approach provides semantic information for training models. Chelba does not disclose or suggest a universal model that includes both a lexical model and a semantic model. Further, Chelba does not disclose or suggest a parse tree including both lexical information and semantic information.

The examiner stated that paragraph [0088] of Chelba teaches a unified model by including a semantic language model 420 and lexical language model 418. It is respectfully submitted that these two entities are separate and distinct (as shown in FIG. 11) and therefore do not disclose a unified model. The models of Chelba are not part of a unified model. Lexicon 418 as set forth in paragraph [0088] does not appear to mean more than a dictionary of

terms that can be researched. More specifically, the lexicon in this situation is not a parse tree and appears to mean a dictionary of terms in a specific environment, e.g., law terms, calculus terms or another set of terms specific to an application. Further, the lexicon 418 of Chelba does not describe parse trees including both lexical information and semantic information.

In addition, the Examiner stated that Chelba suggests use of lexical information for the decoding process. A mere suggestion of such an element without disclosing an element makes an anticipatory rejection improper. If Chelba merely suggests the use of lexical information then the §102(e) rejection is improper since §102(e) requires that all the elements be disclosed.

Claim 31 recites, *inter alia*, a system for speech recognition including a unified language model including a semantic language model and a lexical language model; and a recognition engine configured to find a parse tree to analyze a word group using the lexical model and the semantic model, the parse tree including both lexical information and semantic information, wherein the parse tree is selected based on the lexical information and the semantic information which considers tags, labels, and extensions to recognize speech. Claim 31 has been amended to correct a typographical error.

Chelba, does not disclose or suggest at least: parse trees that include both semantic and lexical information, nor is the parse tree selected based on the lexical information and the semantic information which considers tags, labels, and extensions to recognize speech.

The Examiner cites FIG. 11 of Chelba which shows a lexicon 418. There is no other description and nothing to suggest that the lexicon is incorporated in a semantic model to

form a unified model. In fact, the SLM 420 of Chelba is shown as a separate unit from lexicon 418.

Further, nowhere in Chelba is it disclosed or suggested that a parse tree include lexical information. There is no parse tree which employs both semantic and lexical information in a unified model. As is known, lexical information is different from syntactical information. For example, lexical rules determine how the symbols of the language can be combined (for example, to form tokens) where syntactic rules are directed to how words can be combined to form a sentence.

Since Chelba fails to teach all of the claimed elements of claim 31, claim 31 is believed to be in condition for allowance for at least the stated reasons. Claims 32-43 are also believed to be in condition for allowance due at least to there dependency from claim 31. Reconsideration of the rejection is earnestly solicited.

By the Office Action, claims 1, 3, 5, 8-11, 14, 17-19, 21, 24, 27 and 30 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Chelba in view of U.S. Patent Publication No. 2002/0087316 to Lee et al. (hereinafter Lee).

Claims 1 and 18 have been amended to further prosecution of the case. Claims 1 and 18 include subject matter that has already been searched by the Examiner. Therefore, no new issues that would require a new search are believed to have been raised. Claim 1 and claim 18 now include the subject matter of claims 15, 16 and 28, 29 respectively. As discussed above, Chelba fails to disclose or suggest both semantic information and lexical information in

the parse tree, and fails to disclose or suggest a semantic structured language model which combines a semantic language model and a lexical language model.

The Examiner stated that Chelba does not disclose or suggest generating a set of likely hypotheses in recognizing speech. Lee has been cited to cure this deficiency. Lee is directed to syntactic system where grammars, semantic, and parts of speech are used to recognize speech. Lee does not provide a unified model (lexical and semantic), or a parse tree/parse tree selection based upon lexical and semantic information, as described above. As such, claims 1 and 18 are believed to be in condition for allowance for at least the stated reasons. The dependent claims are also believed to be in condition for allowance due at least to their dependencies from claims 1 and 18, respectively. Reconsideration of the rejection is earnestly solicited.

Claims 15 and 28 were rejected under 35 U.S.C. §103(a) as being unpatentable over Chelba in view of Lee and further in view of Ratnaparkhi ("Learning to Parse Natural Language with Maximum Entropy Models", 1999 (hereinafter Ratnaparkhi)).

The Examiner stated that Chelba and Lee fail to disclose wherein the semantic structured language model is trained by including a unigram feature, a bigram feature, a trigram feature, a current active parent label (Li), a number of tokens (Ni) to the left since current parent label (Li) starts, a previous closed constituent label (Oi), a number of tokens (Mi) to the left after the previous closed constituent label finishes, and a number of questions to classify parser tree entries, wherein the questions include a default, (wj-1), (wj-1, wj-2), (Li), (Li, Ni), (Li, Ni, wi-1), and (Oi, Mi), where w represents a word and j is an index representing word position but that Ratnaparkhi teaches these limitations.

While Ratnaparkhi teaches providing a “limited look ahead” intuition for parsing, the features and questions taught by claims 15 and 28, which have been incorporated into claims 1 and 18 are not disclosed or suggested. Ratnaparkhi does not disclose or suggest a semantic structured language model trained by including a unigram feature, a bigram feature, a trigram feature, a current active parent label (Li), a number of tokens (Ni) to the left since current parent label (Li) starts, a previous closed constituent label (Oi), a number of tokens (Mi) to the left after the previous closed constituent label finishes, and a number of questions to classify parser tree entries, wherein the questions include a default, (wi-1), (wj-1, wj-2), (Li), (Li, Ni), (Li, Ni, wj-1), and (Oi, Mi), where w represents a word and j is an index representing word position. There is nothing in Ratnaparkhi that would lead one skilled in the art to arrive at the present claims 1 and 18.

Section 3.2 and 3.2.1 and FIG. 9 do not teach or suggest the elements as set forth in the present claim 1 and present claim 18 as suggested by the Examiner. Claims 1 and 18 which includes claims 15 and 28 are belied to be in condition for allowance for at least the stated reasons. Reconsideration of the rejection is earnestly solicited.

By the Office Action, claim 2 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Chelba in view of Lee and further in view of U.S. Patent Publication No. 2005/0055199 to Ryzhachkin et al. (hereinafter Ryzhachkin); claims 4, 6-7, 13, 15-16, 20, 22-23, 26 and 28-29 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Chelba in view of Lee and further in view of Ratnaparkhi in “Learning to Parse Natural Language with Maximum Entropy Models”, 1999 (hereinafter Ratnaparkhi); claims 34, 36-37 and 39-40 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Chelba in view of Ratnaparkhi;

and claims 12 and 25 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Chelba in view of Lee and further in view of San Segundo et al., "Confidence Measures for Spoken Language Dialogue Systems", 2001 (hereinafter San Segundo).


Claims that depend from claims 1, 18 and 31 respectively are also believed to be in condition for allowance for at least the stated reasons.

In view of the foregoing amendments and remarks, it is respectfully submitted that all the claims now pending in the application are in condition for allowance. Early and favorable reconsideration of the case is respectfully requested.

It is believed that no additional fees or charges are currently due. However, in the event that any additional fees or charges are required at this time in connection with the application, they may be charged to applicant's IBM Deposit Account No. 50-0510.

Respectfully submitted,

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